BEFORE
THE PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

DOCKET NO. 2018-319-E

In the Matter of:	)	
	)	**MOTION FOR LEAVE TO FILE DIRECT**
Application of Duke Energy Carolinas,	)	**TESTIMONY OF STEVE IMMEL**
LLC for Adjustments in Electric Rate	)	**ADOPTING THE DIRECT**
Schedules and Tariffs	)	**TESTIMONY OF**
	)	**JOSEPH A. MILLER JR.**

Duke Energy Carolinas, LLC ("Duke Energy Carolinas" or "Company") moves for leave to file direct testimony for Company witness Steve Immel, Vice President of Carolinas Coal Generation for Duke Energy, in order to allow the witness to adopt the pre-filed direct testimony of witness Joseph A. Miller Jr. In support of this Motion, Duke Energy Carolinas respectfully shows the Commission the following:

On November 8, 2018, the Company filed its Application for Adjustments in Electric Rate Schedules and Tariffs and Request for an Accounting Order, supporting direct testimony and exhibits, and Form E-1 data. The pre-filed direct testimony includes the testimony of Company witness Joseph A. Miller Jr.

Due to Mr. Miller transitioning to a different role in Duke Energy effective January 14, 2019, the Company respectfully requests that Mr. Immel be allowed to adopt the testimony of Mr. Miller.

The Company proposes for Mr. Immel to adopt Mr. Miller's testimony in full (with the exception of the addition of Mr. Immel's Introduction and Overview section as indicated on page 2, line 1 through page 3, line 11 of Mr. Immel's testimony). The proposed direct testimony of Mr. Immel is attached to this Motion.

Given that Mr. Immel would adopt testimony previously pre-filed with its Application in this docket, the Company asserts that no party will be prejudiced by this Motion.

WHEREFORE, Duke Energy Carolinas respectfully requests leave to file the attached direct testimony of Steve Immel in this proceeding.

Respectfully submitted this 11th day of February, 2019.

Heather Shirley Smith
Deputy General Counsel
Duke Energy Carolinas, LLC
40 W. Broad St., Suite 690
Greenville, SC 29601

and

s/Frank R. Ellerbe, III
Frank R. Ellerbe, III
ROBINSON GRAY STEPP & LAFFITTE, LLC
Post Office Box 11449
Columbia, South Carolina 29211
Telephone: (803) 227-1112
fellerbe@robinsongray.com

ATTORNEYS FOR DUKE ENERGY CAROLINAS, LLC

BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA

DOCKET NO. 2018-319-E

In the Matter of:	)	
	)	**DIRECT TESTIMONY OF**
Application of Duke Energy Carolinas, LLC	)	**STEVE IMMEL**
for Adjustments in Electric Rate Schedules	)	**FOR DUKE ENERGY**
and Tariffs	)	**CAROLINAS, LLC**

I. INTRODUCTION AND OVERVIEW

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Steve Immel and my business address is 526 South Church Street, Charlotte, North Carolina.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am Vice President of Fossil Hydro Operations ("FHO") for Duke Energy Carolinas, LLC ("DE Carolinas" or the "Company") and Duke Energy Progress, LLC ("DE Progress").

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND.

A. I graduated from the University of Kentucky with a Bachelor of Science degree in Civil Engineering and a Masters of Business Administration from Queens College. My career began with Duke Energy (d/b/a Duke Power) in 1980 as an Associate Design Engineer. Since that time, I have held various roles of increasing responsibility in corporate facilities, investment recovery, supply chain, and operations areas, including the role of Station Manager first at DE Carolinas' Allen Steam Station and then Marshall Steam Station. I was named Vice President of Duke Energy Indiana's Midwest Regulated Operations in 2012 and Vice President of Outage and Project Services in 2014. I assumed my current role in 2016.

Q. WHAT ARE YOUR DUTIES AS VICE PRESIDENT OF CENTRAL SERVICES?

A. In this role, I am responsible for providing event free and reliable operations of the coal generation fleet, which includes seven coal stations, serving South Carolina and North Carolina by providing over 10,000 MWs of generation. My responsibilities include operating and maintaining the fleet within design parameters and implementing safe work practices and procedures to ensure the safety of our employees.

Q. HAVE YOU TESTIFIED BEFORE THIS COMMISSION IN ANY PRIOR PROCEEDINGS?

A. No.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to support DE Carolinas' request for a base rate adjustment. My testimony will describe the Company's Fossil/Hydro/Solar generation assets and update the Commission on capital additions. Since its last rate case, DE Carolinas has built additional generating facilities to service customers. Specifically, the Company completed the new W.S. Lee Combined Cycle ("CC") plant in April 2018, which provides 753 MWs of capacity, of which 653 MWs is owned by DEC, an investment of approximately $639 million. This new plant emits carbon dioxide at half the rate, and nitrogen and sulfur oxide emissions at a fraction of the rate compared to existing and retired coal plants. Additionally, DE Carolinas completed the

Catawba-Wateree relicensing effort for the 13 hydro stations, an investment of approximately $126 million. The new license will allow these stations to operate until 2055. Further, to advance towards a more sustainable energy future, DE Carolinas constructed two large solar projects (Mocksville and Monroe) in 2016 and 2017. These projects have been completed and add a total of 75 MWs of nameplate capacity, providing 35 MWs of relative dependable summer capacity, an investment of approximately $152 million.

Finally, I provide operational performance results for the period January 1, 2017 through December 31, 2017 (the "Test Period"); explain the key drivers impacting operations and maintenance ("O&M") expenses; and provide an overview of capital planned for the next few years for Fossil/Hydro/Solar generation asset investments.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. The remainder of my testimony is organized as follows:

II. FOSSIL/HYDRO/SOLAR FLEET

III. CAPITAL ADDITIONS

IV. O&M AND OTHER ADJUSTMENTS

V. PERFORMANCE

VI. CAPITAL BUDGET AND COST DRIVERS

VII. CONCLUSION

II. FOSSIL/HYDRO/SOLAR FLEET

Q. PLEASE DESCRIBE DE CAROLINAS' FOSSIL/HYDRO/SOLAR GENERATION FLEET.

A. The Company's Fossil/Hydro/Solar generation portfolio consists of approximately 14,966 megawatts ("MWs") of generating capacity, made up as follows:

Coal-fired -	6,764 MWs
Steam Natural Gas -	170 MWs
Hydro -	3,245 MWs
Combustion Turbines -	2,665 MWs
Combined Cycle -	2,083 MWs
Solar -	39 MWs

The coal-fired assets consist of four generating stations and a total of 13 units. These units are equipped with emissions control equipment, including selective catalytic or selective non-catalytic reduction ("SCR" or "SNCR") equipment for removing nitrogen oxides ("NO_x") and flue gas desulfurization ("FGD" or "scrubber") equipment for removing sulfur dioxide ("SO_2"). In addition, all 13 coal-fired units are equipped with low NO_x burners. The steam natural gas unit – W.S. Lee Station Unit 3 – is considered to be a peaking unit.

The Company has a total of 31 simple cycle combustion turbine ("CT") units, of which 29 are considered the larger group providing approximately 2,581 MWs of capacity. These 29 units are located at Lincoln, Mill Creek and Rockingham Stations, and are equipped with water injection systems that reduce NO_x and/or have low NO_x burner equipment in use. The W.S. Lee CT facility includes two units with a total capacity of 84 MWs equipped with black start ability in support of DEC's Oconee Nuclear Station. The 2,083 MWs, shown

earlier as "combined cycle" ("CC"), represent the Buck CC, Dan River CC and W.S. Lee CC facilities. These facilities are equipped with technology for emissions control including selective catalytic reductions (SCRs), low NO_x combustors, and carbon monoxide/volatile organic compounds catalysts. The Company's hydro fleet includes two pumped storage facilities with four units each that provide a total capacity of 2,140 MWs, along with conventional hydro assets consisting of 74 units providing approximately 1,105 MWs of capacity. The 39 MWs of solar capacity are made up of 18 roof top solar sites providing 4 MWs of relative summer dependable capacity, the Mocksville solar site providing 7 MWs of relative summer dependable capacity and the Monroe solar site providing 28 MWs of relative summer dependable capacity.

Q. WHAT CAPACITY CHANGES HAVE OCCURRED WITHIN THE FLEET SINCE THE 2013 RATE CASE?

A. As mentioned previously, the Company's recent major new generation additions include the W.S. Lee CC plant, which provides 653 MWs of DE Carolinas' capacity, and the addition of two solar facilities adding a total of 75 MWs of nameplate capacity, providing 35 MWs of dependable capacity. DE Carolinas has also retired older coal plants at Riverbend, Buck and W.S. Lee for a reduction of 910 MWs. W.S. Lee Unit 3 coal was converted to natural gas in May 2015, maintaining 170 MWs.

Q. WERE UPDATES MADE TO THE PROBABLE RETIREMENT DATES OF FOSSIL HYDRO PLANTS INCLUDED IN THE RECENT DEPRECIATION STUDY?

A. Yes, there were updates made to the probable retirement dates for several fossil plants to better align with the industry information for supercritical and subcritical coal units and assumptions for future environmental regulations. Specifically, the probable retirement date for Allen Station was updated to 2026; the probable retirement date Cliffside Unit 5 was updated to 2032; the probable retirement date for Belews Creek Station was updated to 2037; and the probable retirement for Marshall Station was updated to 2034.[1]

The following hydro stations retirement dates were changed to 2055 to align with expiration of their FERC operating license: Bridgewater, Cedar Creek, Cowan's Ford, Dearborn, Fishing Creek, Great Falls, Lookout Shoals, Mountain Island, Oxford, Rhodhiss, Rocky Creek, Wateree, and Wylie.

III. CAPITAL ADDITIONS

Q. PLEASE DESCRIBE THE MAJOR FOSSIL/HYDRO/SOLAR CAPITAL PROJECTS COMPLETED SINCE THE COMPANY'S LAST RATE CASE PROCEEDING.

A. The major Fossil/Hydro/Solar capital projects in service and included in this request total approximately $917 million. The addition of the W.S. Lee CC, totaling approximately $639 million, further increases the Company's use of natural gas at a time when pricing has been at favorable lows, and features state-of-art technology for increased efficiency and significantly reduced emissions. DE Carolinas also added the Mocksville and Monroe solar sites in

[1] As explained in Witness Doss's testimony at pages 9-10, the probable retirement dates used in the Depreciation Study represent the date of the last projected retirement for each plant/depreciable group.

late 2016 and early 2017, with a total of 75 MWs of nameplate capacity providing 35 MWs of relative dependable summer capacity. The Mocksville solar site totaling $34 million and the Monroe site at $118 million provides DE Carolinas customers with carbon free generation. The Company has 13 hydro stations on the Catawba and Wateree river basins, and has completed the relicensing effort for the hydro stations on the Catawba-Wateree, totaling $126 million. The 40 year license (FERC #2232) was granted in November 2015 and allows our stations to operate until 2055.

Q. DID THE COMPANY RECEIVE REGULATORY APPROVAL FOR THE CONSTRUCTION OF THE NEW COMPLETED GENERATION FACILITIES INCLUDED IN THIS CASE?

A. Yes. The Mocksville and Monroe solar facilities were granted certificates of public convenience and necessity ("CPCNs") by the North Carolina Utilities Commission in Docket Nos. E-7 Sub 1098 and Sub 1079, respectively. The W.S. Lee CC was granted a Certificate of Environmental Compatibility and Public Convenience and Necessity ("CECPCN") by the Public Service Commission of South Carolina in Docket No. 2013-392-E.

Q. MR. IMMEL, ARE THESE CAPITAL ADDITIONS USED AND USEFUL IN PROVIDING ELECTRIC SERVICE TO DE CAROLINAS' ELECTRIC CUSTOMERS IN SOUTH CAROLINA?

A. Yes. The Company's new solar facilities and W.S. Lee CC described above are commercially operational. The solar facilities provide clean, carbon free generation to benefit customers, and the new CC plant provides state-of-the-

art technology for efficiency and flexibility of operation, along with the best available technology for environmental controls. Likewise, the Company's investments in maintenance capital and compliance efforts position the Company for the continued safe, reliable and efficient operation of these assets, with high quality operational performance.

Q. IN YOUR OPINION, HAVE THE COSTS RELATED TO THE COMPANY'S CAPITAL ADDITIONS BEEN PRUDENTLY INCURRED?

A. Yes. The Company controls costs for capital projects and O&M using a cost management program. The Company also controls costs through routine executive oversight of project budget and activity reporting with new projects requiring approval by progressively higher levels of management depending on total project cost. Further, the Company controls ongoing project and O&M costs through strategic planning and procurement; efficient oversight of contractors by a trained and experienced workforce; rigorous monitoring of work quality; thorough critiques to drive out process improvement; and industry benchmarking to ensure best practices are being used.

Q. HOW DO CUSTOMERS BENEFIT FROM THE COMPANY'S MANAGEMENT EFFORTS FOR THE FOSSIL/HYDRO/SOLAR FLEET?

A. Our customers benefit from DE Carolinas' modernization efforts in multiple ways. Initially, as demonstrated by the Company's resource planning analyses, the Company's fleet modernization efforts have enabled it to

continue to provide safe, efficient and reliable service to DE Carolinas' customers at least reasonable cost. These efforts have also reduced the Company's environmental footprint by adding state-of-the-art technology for reducing emissions, retiring older facilities that lacked environmental equipment and were not economically positioned for needed capital expenditures, and expanding the use of natural gas generation at a time when the natural gas market is providing historically low prices.

IV. O&M AND OTHER ADJUSTMENTS

Q. PLEASE DESCRIBE THE O&M EXPENSES FOR THE FOSSIL/HYDRO/SOLAR FLEET.

A. For the fossil units, approximately 79 percent of DE Carolinas' required O&M expenditures are fuel-related for the Test Period. The majority of non-fuel expenditures are for labor costs from Company or contract resources that operate, maintain, and support the Fossil/Hydro/Solar facilities. Additionally, DE Carolinas has incurred incremental non-fuel O&M costs in order to operate and maintain the new generation resources described in this testimony. Finally, the Company continues to be challenged by costs driven by inflationary pressures for labor and materials.

Q. HOW DOES THE COMPANY CONTROL AND MITIGATE O&M EXPENSE INCREASES? PLEASE PROVIDE EXAMPLES.

A. The Company has many efforts in place for controlling and/or saving costs. For example, DE Carolinas optimizes outages based on run time, which has been affected by: (1) changes in the gas market; (2) milder than normal

weather during 2016 - 2017; and, (3) new generation resources that further increased DE Carolinas' use of natural gas. This effort has provided savings with labor and material costs.

Duke Energy joined forces with other power companies to share best practices and learning opportunities with the Fossil Networking Group ("FNG"). The FNG includes Southern Company, Dominion Resources, American Electric Power and the Tennessee Valley Authority, who along with the Company, have seen tangible benefits in the area of safety and operations.

The Company runs its business in a disciplined manner and continuously balances cost management with safety and reliability to provide generation to our customers. Cost to customers is a key concern and the Company's diverse portfolio allows us to reduce overall fuel expense and take advantage of low natural gas prices.

V. PERFORMANCE

Q. PLEASE DISCUSS THE OPERATIONAL RESULTS FOR DE CAROLINAS' FOSSIL/HYDRO/SOLAR FLEET DURING THE TEST PERIOD.

A. The Company's Fossil/Hydro/Solar generating units operated efficiently and reliably during the Test Period. Several key measures are used to evaluate the operational performance depending on the generator type: (1) equivalent availability factor ("EAF"), which refers to the percent of a given time period a facility was available to operate at full power, if needed (EAF is not affected by the manner in which the unit is dispatched or by the system demands; it is

impacted, however, by planned and unplanned maintenance (i.e., forced outage time); (2) equivalent forced outage rate ("EFOR"), which represents the percentage of unit failure (unplanned outage hours and equivalent unplanned derated hours); a low EFOR represents fewer unplanned outage and derated hours, which equates to a higher reliability measure; and (3) starting reliability ("SR"), which represents the percentage of successful starts.

The chart below provides operational results categorized by generator type, as well as results from the most recently published North American Electric Reliability Council ("NERC") Generating Unit Statistical Brochure ("NERC Brochure") representing the period 2013 through 2017. The NERC data reported for the coal-fired units represents an average of comparable units based on capacity rating. The data in the chart reflects DEC results compared to NERC five-year comparisons.

Generator Type	Measure	Review Period	2013-2017	Nbr of Units
		DEC Operational	NERC Average	
Coal-Fired Test Period	EAF	78.5%	78.4%	752
	EFOR	4.8%	8.7%	
2017 Summer	Coal-Fired EAF	95.9%	n/a	n/a
	Combined Cycle EAF	94.7%	n/a	n/a
Total CC Average	EAF	92.3%	85.0%	338
	EFOR	0.07%	5.3%	
Total CT Average	EAF	84.7%	87.8%	776
	SR	99.4%	98.1%	
Hydro	EAF	88.8%	80.4%	1,113

Q. HOW MUCH GENERATION DID EACH TYPE OF GENERATING FACILITY PROVIDE FOR THE TEST PERIOD?

A. For the Test Period, DE Carolinas' system total generation was approximately 97.6 million megawatt-hours ("MWHs"). The Fossil/Hydro/Solar fleet provided approximately 37.3 million MWHs, or approximately 38 percent. The breakdown includes approximately 26 percent contribution from the coal-fired stations, 11 percent from gas facilities, and approximately 1 percent from renewable facilities, primarily hydro.

Q. IN YOUR OPINION, HAS DE CAROLINAS PRUDENTLY OPERATED ITS FOSSIL/HYDRO/SOLAR FLEET DURING THE TEST PERIOD?

A. Yes. The Company's performance data supports the conclusion that DE Carolinas has reasonably and prudently operated and maintained its Fossil/Hydro/Solar resources to maximize unit availability, minimize fuel costs and provide safe and reliable service to its customers.

VI. CAPITAL BUDGET AND COST DRIVERS

Q. WHAT IS THE ANTICIPATED CAPITAL BUDGET FOR FOSSIL/HYDRO/SOLAR OPERATIONS OVER THE NEXT THREE YEAR PERIOD?

A. In order to continue to provide reliable service to customers, DE Carolinas plans to invest approximately $1 billion in its Fossil/Hydro/Solar fleet during the period 2019 - 2021. Key efforts included in this projection are costs for the Bad Creek Pumped Storage runner upgrade project, dual fuel co-firing at Marshall and Belews Creek stations, future new generation facilities and other maintenance capital expenses.

VII. CONCLUSION

Q. IS THERE ANYTHING YOU WOULD LIKE TO SAY IN CLOSING?

A. Yes. The Company has a proven history of experience-based, safe, quality, and cost competitive operations of a diverse generation portfolio. The Company has been active and diligent in its modernization efforts to ensure the right investments that continue, and build on, DE Carolinas' solid history of safely providing reliable, efficient, and cost effective generation while reducing environmental impacts and ensuring compliance with state and federal regulations. The diversity of the Company's generation assets provide significant benefit to customers in an economic dispatch environment, especially with the natural gas market continuing to experience low prices. DE Carolinas is positioned to continue as a leader in the industry with a solid base of knowledge and experience. This base rate increase will allow the Company to continue the tradition of operational excellence and focus on safe operations and reliable generation.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.